

## Lameness in Poultry



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Lameness is a problem in commercial chicken, both broilers & layers, and poultry producers and farmers are clueless about its reason and control. Today's chicken has huge genetic potential and are meant for fast growth in

broilers and almost one egg every day for layers. The major constraints of poultry production today are awareness about the need of today's chicken to reach genetic potential targeted production, feed raw material cost & biosecurity. I strongly feel that the reason of lameness lies within these constraints only and I will try to discuss about them point wise in this article

### Factors Contributing Towards Lameness

#### A. Non-infectious:

1. Nutritional Imbalance
  - i. Calcium - Phosphorus Imbalance
  - ii. Vitamin D Deficiency
  - iii. Vitamin B1 Deficiency
  - iv. Biotin Deficiency
  - v. Vitamin B12 Deficiency
  - vi. Zinc Deficiency
2. Toxicity: Coccidiostat Ionophore Toxicity
3. Mycotoxin: Deoxynivalenol (DON) toxicity
4. Poor Management: Poor bedding (litter condition) material

#### B. Infectious:

##### 1. Bacterial

- i) Bacterial Chondronecrosis by *Enterococcus cecorum*, *Streptococcus* spp, *Staphylococcus* spp & *E coli*
- ii) Vertebral Osteomyelitis/ Spondylitis /Kinkyback due to *Enterococcus cecorum*, *Staphylococcus* spp & *E Coli*
- iii) Bumble Foot Disease or Pododermatitis or Foot Pad Dermatitis by *Staphylococcus* spp
- iv) Fowl Cholera

v) Infectious Synovitis

##### 2. Viral

- i) Tenosynovitis/ Viral Arthritis
- ii) Marek's Disease (MD)
- iii) Avian Encephalomyelitis (AE)
- iv) Ranikhet Disease (ND or RD)



### Calcium-Phosphorus Imbalance

#### Contributing Factors:

- Available calcium & available phosphorus ratio in feed
- Excess or shortage of anyone can affect utilization of other

#### Symptoms:

- Rickets in young chicken; both broiler & layer
- Osteomalacia (fragile soft bone) & Osteoporosis (porous or spongy bone) in laying hens

#### Treatment & Control:

- Management of age-wise available phosphorus & calcium ratio in feed
- Quality assessment of raw material like DCP, MCP & MBM before use

### Vitamin D Deficiency

#### Contributing Factors:

- Zero access to sunlight for commercial birds in captivity
- Poor gut health heavily affects absorption of fat soluble Vit D
- Damaged kidney & liver can't convert Vit D to metabolizable form to be used in the body

#### Symptoms:

- Muscle weakness leading to lameness
- Pain & fatigue
- Depression

#### Treatment & Control:

- Gut health maintenance is the basic principle to prevent lameness due to Vit D deficiency because poor gut health affects Vit D utilization heavily.
- Vit D3 level in first (PBS or BS) shall be 4000 – 5000 IU

#### Vitamin B1 Deficiency

##### Contributing Factors:

- Feeding medicated starter feed containing Amprolium to chicks
- Breeding parents deficient in Thiamine
- Poor feed intake
- Reduced absorption due to poor gut health
- Consumption of Fusarium mycotoxins in feed

##### Symptoms:

- Leg weakness
- Ataxia
- Tremor
- Unsteady gait
- Paralysis of legs, wings & neck
- Walking on hocks
- Stargazing attitude

##### Treatment & Control:

- Gut health maintenance to improve vitamin absorption
- Control of mycotoxin in feed
- Avoid Amprolium in first feed
- Water vitamin supplementation for 5 – 7 days helps minimizing losses

#### Vitamin B12 Deficiency

##### Contributing Factors:

- Intestinal malabsorption: Includes gastrointestinal conditions affecting the chicken's small intestine
- Decreased stomach acid production: Provides an ideal environment for the overgrowth of anaerobic bacteria in the bird's stomach, which further interferes with vitamin B12 absorption
- Vitamin B12 deficient feed formulation

##### Symptoms:

- Nervous system impairment with leg weakness & perosis
- Stunted growth
- Loss of appetite
- Poor feather

##### Treatment & Control:

- Gut health maintenance
- Supplement through feed
- Emergency water supplementation for few days

#### Biotin Deficiency

##### Contributing Factors:

- Corn, soya or wheat are very poor sources of Biotin and hence every care to be taken to maintain its requirement through synthetic sources
- Use of sulpha drugs, such as Sulphathalidine
- Feeding birds with mold contaminated feed

##### Symptoms:

- Poor growth
- Leg weakness
- Thickened foot pad

- Chondrodystrophy
- Fatty Liver Kidney syndrome

##### Treatment & Control:

- Avoid feed with mold contamination
- Avoid unnecessary use of Sulpha drugs
- Compulsory supplement through feed
- Emergency water supplementation for few days

#### Manganese Deficiency

##### Contributing Factors:

- Unbalanced diet
- Seed based diet
- Poor gut health leading to poor absorption

##### Symptoms:

- In young chicks slipped tendon or perosis, characterized by swelling and flattening of the hock joint, along with subsequent slipping of the Achilles tendon from the condyles
- One or both of the chick's legs may be affected
- The tibia and tarsometatarsus may be bending closer to the hock joint, and may demonstrate lateral rotation
- The long bones of the chick's legs and wings may also be shorter and thicker

##### Treatment & Control:

- Provide additional supplements of manganese (Mn) in order to ensure total intake of 60 mg/kg feed in a balanced diet
- Don't provide chicks additional calcium until they start laying eggs in layer
- Emergency use of water medication will help reduce the loss

#### Ionophore Toxicity

##### Contributing Factors:

- Monensin 120 ppm or above is toxic to broiler and careless use of excess dose results toxicity

##### Symptoms:

- Reduce feed intake
- Characteristic paralysis in which the legs are extended backward

##### Treatment & Control:

- Control on dose in premix
- Do not use Monensin over 3 months continuously

#### DON (Deoxynivalenol) Toxicity

##### Contributing Factors:

- Tight junction integrity disruption
- Translocation of bacteria from the intestine through disrupted tight junctions to the femoral head

##### Symptoms:

- Ongoing pressure of growth results in micro fractures and eventually degeneration of the joint
- Lameness

##### Treatment & Control:

- Avoid mycotoxin contaminated raw materials
- Avoid mycotoxin build up in finished feed

## Pododermatitis or Foot Pad Dermatitis or Bumble Foot Disease

### Contributing Factors:

- Causative bacteria are Staphylococcus spp
- Hard, muddy, flooded, uneven or rough floor surfaces
- Damp or unsanitary bedding (litter)
- Vitamin A deficiency
- Overweight, lack of activity
- Excessive activity due to fighting among flock members
- Excessive accumulation of faeces on litter

### Symptoms:

- Bumblefoot is a common inflammatory condition affecting the bottom of the chicken's foot; footpad & toes
- The most frequent presentation is a hard, puss-filled abscess of the underlying tissue and structures covered by a brown to black coloured scab
- The ulcers can cause swelling, redness, and heat under the skin and cause the surface area to thicken
- Often, a scab or crust will cover the lesion
- As the severity of the infection increases, so does the pain, and chickens are often reluctant to walk and/or appear lame
- The situation helps entry of secondary bacterial infections



### Treatment & Control:

- Concrete or hard muddy floor with even surface
- Clean, light & soft litter material
- Litter thickness as per season & body weight target
- Proper ventilation
- Humidity control
- Gut health maintenance
- Emergency removal of litter material and new bedding material placement
- Antibiotic Treatment considering the morbidity & degree of infection

## Bacterial Chondronecrosis

### Contributing Factors:

- Responsible Bacteria are Enterococcus cecorum, Streptococcus spp, Staphylococcus spp & E coli
- Rapid growth rate during first 4 weeks combined with inappropriate untrition support
- Poor gut health
- Poultry house environment hygiene under question

### Symptoms:

- Chondronecrosis is caused by bacterial infections in sites prone to microfractures such as proximal femoral, tibial

growth plates, articular cartilage and flexible thoracic vertebrae. The infection reaches the growth plate via the blood stream after getting entry through GI or respiratory route.

- Restriction of movements
- Poor feed intake & poor growth
- Significant mortality due to starvation in 3 – 4 days
- Post mortem examinations reveals large abscesses on the femoral head, tibial head & on vertebrae

### Treatment & Control:

- Proper nutritional balanced diet
- Gut health maintenance
- Good house hygiene
- Antibiotic treatment considering the bacterial spp
- Good litter condition throughout the flock
- Proper ventilation to control humidity in closed EC shed.

## Vertebral Osteomyelitis or Spondylitis or Kinkyback

### Contributing Factors:

- Kinky-back is defined as the ventral dislocation of the anterior end of the articulating 4th thoracic vertebrae
- The 4<sup>th</sup> thoracic vertebrae rotates the posterior end, causing it to pinch the spinal cord. The damage to the spinal cord causes paralysis in the bird
- Chickens with kinky back syndrome are often seen sitting on their tail, extending their feet outward or letting them fall over to one side of their body
- Once the condition stops birds from being able to walk, they are unable to reach food or water on their own, and are at risk of dying from starvation
- Heavy, meat-type broilers are more prone to developing this condition, as a result of rapid growth
- Females are more at risk than males.

### Symptoms:

- Typically starts from day 22; bird will be sitting on its breast/keel, with the legs directed forward, posterior paralysis due to spinal cord compression.
- Arched back
- Extending neck outward
- Using wings to assist walking
- Hock sitting posture
- Lameness
- Sitting on tail with feet extended
- Falling over sideways
- Abscess and/or necrosis in T4-T7 vertebrae, dorsal buckling of spinal cord (kyphosis), interstitial oedema, atrophy & degeneration of muscle fibres

### Treatment & Control:

- Gut health maintenance
- Good poultry house hygiene
- Antibiotic treatment considering the bacterial spp
- Good litter condition throughout the flock
- Proper ventilation

## Fowl Cholera

### Contributing Factors:

- Fowl cholera (FC) is a highly contagious bacterial disease caused by Pasteurella multocida

### Symptoms:

- Chronic Form of FC presents as a localized infection; swelling, inflammation, and abscess on foot pad & joints causing Lameness

#### Treatment & Control:

- Tetracycline Inj 5mg/Kg BW, may be repeated after 48 hours
- Multi strain probiotic to support the already disturbed gut health
- Immediate isolation of all infected birds from the flock

#### Infectious Synovitis or MS Infection

##### Contributing Factors:

- An Acute to Chronic disease caused by Mycoplasma synoviae, a world-wide problem now

##### Symptoms:

- Chickens with infectious synovitis develop swollen, red & warm hock joints and footpad
- They are in so much pain it is difficult for them to walk resulting in lameness
- Unable to reach the feed leading to poor growth, unevenness in flock and slow mortality
- The synovial membranes of tendon sheaths are thickened, oedematous, with fibrinous exudates accumulating within and around the tendon sheaths.

##### Treatment & Control:

- Prevention is through vaccination of breeder
- Culling of affected breeder flock as the disease mainly transmits vertically
- Antibiotic injection like Tylosin @ 20 -30 mg/KgBW helps reducing loss
- Drinking Water treatment with Tylosin, Tyilmicosin or Tylovalosin @ 25 - 30mg/Kg BW is effective
- Chlortetracycline may be given through water for effective results to control complicating E coli

#### Tenosynovitis or Viral Arthritis or Reo Disease

##### Contributing Factors:

- Different serotypes of avian reovirus
- It occurs predominately in commercial “meat-type” chickens
- Broiler chicks from non-vaccinated parents are more susceptible

##### Symptoms:

- Marked swelling of the digital flexor and metatarsal extensor tendons, which are located just above the hock joint
- The swelling area usually feels warm to touch
- The foot pad and hock joint also swollen
- Once the disease is advanced, the articular cartilage of the joint can completely erode, resulting in chronic tendinitis and rupture of the gastrocnemius tendon
- At this stage, there is green discoloration of skin & subcutaneous tissues at the site of rupture due internal bleeding; the bird is unable to extend affected foot or put weight on the leg resulting lameness

##### Treatment & Control:

- Vaccination of broiler breeder with all available serotype is the best way of protection
- Biosecurity in both broiler and breeder farm
- Anti-Viral drug & immuno-stimulant help reducing losses

#### Marek's Disease or MD

##### Contributing Factors:

- Highly contagious disease developing tumours in the nerve

sheath resulting in lameness

##### Symptoms:

- Enlarged nerves are the most consistent gross lesions in affected birds; various peripheral nerves, particularly the vagus, brachial & sciatic become enlarged and lose their striations
- Transient paralysis (TD): Vasogenic brain oedema; causes temporary incoordination (ataxia), partial to complete paralysis of the neck or legs, lasting only 1 to 2 days
- One leg is straight forward and other back
- Paralysis of legs, wings & neck
- Torticollis, Incoordination
- Reddened Leg

##### Treatment & Control:

- Vaccination of breeder is the best way of protection
- Vaccination of broiler chicks at hatchery gives protection after 7 - 14 days
- Biosecurity in both broiler & breeder farm

#### Avian Encephalomyelitis or AE

##### Contributing Factors:

- AE, also referred to as epidemic tremor, is an infectious neurological disease caused by a picornavirus
- It occurs in young chicken between 1-3 weeks age
- Chicks from non-vaccinated parents are at high risk of developing the disease

##### Symptoms:

- Seizure like activity
- Spinning
- Ataxia (incoordination & stumbling)
- Rapid trembling of head & neck
- Paralysis

##### Treatment & Control:

- Vaccination of breeder is the best way of protection
- Biosecurity in both broiler and breeder farm

#### Ranikhet Disease (RD) Or Newcastle Disease (ND)

##### Contributing Factors:

- ND or RD is a highly contagious viral disease, causing heavy mortality with symptoms resulting disabilities

##### Symptoms:

- Uncoordinated (ataxia) walk and movements, where affected birds may be seen stumbling frequently, and appear to lack proper balance.
- Unilateral or bilateral partial or complete paralysis of their legs and wings
- Head tremor
- Twisted neck (Torticollis)
- Convulsion, Circling
- Muscle spasms
- Lethargy

##### Treatment & Control:

- Vaccination of breeder is the best way of protection
- Vaccination of Broiler considering the field challenge control ND effectively
- Biosecurity in both broiler and breeder farm